GOVERNMENT OF INDIA
AGRICULTURE AND FARMERS WELFARE
LOK SABHA

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Impact of Climate Change
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Will the Minister of AGRICULTURE AND FARMERS WELFARE be pleased to state:

(a) whether the Government is aware of the challenges of unknown biotic stress in crops/animals due to climate change and if so, the details thereof;

(b) whether the Government has taken up the matter with the State Governments for effective cooperation in the matter and if so, the details thereof and the response of the State Governments thereto;

(c) whether the Government has extended funds to States for this purpose and if so, the details thereof; and

(d) the steps taken by the Government for developing biotic stress resilient crops and breeding animals using indigenous as well as wild resources and the outcome thereof?

Answer

MINISTER OF STATE IN THE MINISTRY OF AGRICULTURE AND FARMERS WELFARE
(SHRI SUDARSHAN BHAGAT)

(a) Yes, Madam. National Innovations in Climate Resilient Agriculture (NICRA) launched by ICAR is in operation since 2011 in a network mode addresses the aspect of dealing with challenges of unknown biotic stress through Real Time Pest Dynamics (RTPD) program having exploratory surveys and real time ICT based surveillance. The Real Time Pest Dynamic (RTPD) program is implemented in 25 locations across 11 states covering 12 Agro-climatic zones / 12 Agro ecological regions in four target crops (rice, pigeonpea, groundnut & tomato) under leadership of NCIPM, New Delhi since 2011. In addition to these crops RTPD program is implemented on mango under leadership of ICAR-RCER covering 120 mango orchards in six different mango growing belts viz., Ranchi in Jharkhand, Lucknow in Uttar Pradesh, Vengurla in Maharashtra, Paria in Gujarat, Sangareddy in Telangana and Bengaluru in Karnataka states.

Various AICRP centers from different State Agricultural Universities (SAUs) are the partners of the program. Attempts are being made to identify the new records of insect pests and diseases in these crops due to climate variability and change. New record of Tuta absoluta infesting tomato leaves, Pyralid fruit borer (Citripestis eutraphera) on mango, Ghujhia Weevil, (Tanymecus indicus) on pigeonpea and lepidopteran cut worm, (Anarsia ephippias) on groundnut were reported from different regions of the country. The causative climate driven factors and climate variability in their incidence is now being emphasized.

In poultry increased temperatures due to climate change results in reduction in immune system of the birds and make them susceptible to several diseases. Attempts are being made to manage this climatically induced diseases viz., viral diseases (Ranikhet), bacterial diseases (Gumbors) through nutritional management using phyto chemicals, plant extracts, osmolites, organics and vitamins.

The climate change may cause increase in ambient temperature leading to abundance of vector and increase in vector-borne diseases including various zoonotic diseases, scarcity of feed and fodder, clean potable water, etc. To study the effect of increased temperature stress and water deprivation stress on immune status of the both indigenous breed - Tharparkar and crossbred cattle, study was under taken in controlled thermal stress condition and also in different seasons.

In the global climate change, it is expected that there will be increase incidence of vector and intermediated host. To generated data prevalence of various vector and intermediate host were also studied in five agro-climatic zones which included Western Dry, upper Gangetic Plain, Trans-Gangetic Plain, Central Pleateu & Hills and Western Himalaya. Our results suggested that there were prevalence of Theileriaannulata, Fasciola & amphistomes infection was recorded infection in cattle in four out of five agro-climatic zones except Western Himalayan region. The Rhipicephalus microplus (formerly Boophilus) tick was more commonly prevalent ticks than Hyalomma ticks except in western dry region where Hyalomma cases were more.

Animal diseases like anthrax, black quarter, foot and mouth disease, goat pox, anaplasmosis, theileriosis, etc., are highly correlated with weather parameters. Bio-climatic graphs for each of the disease have been prepared along with risk maps. This will enable in development of threshold levels of climate variables on incidence of livestock diseases by developing correlation indices between climatic variables and risk factors. It is possible to predict incidence of livestock diseases at different locations.

(b) The outputs of strategic research under NICRA (esp. pest forewarning models) elucidated for different States have been validated and are in process of dissemination by State machinery and SAUs.

(c) Various AICRP centers from different State Agricultural Universities (SAUs) are the partners of Real Time Pest Dynamics (RTPD) program under NICRA. Rs. 5 lakhs/year/centre was released as recurring contingencies for the implementation of program under the leadership of NCIPM, New Delhi.

(d) Large numbers of germplasm lines have been collected by ICAR partner institutes throughout the country under NICRA Project. They were characterized for identifying resistance sources for genetic enhancement against several climatically sensitive pests and diseases like yellow rust disease in wheat, blast disease in rice, yellow mosaic disease, powdery mildew, leaf spot in mung bean, etc.

It was found that effect of thermal stress was more pronounced on crossbred cattle as compared to indigenous cattle when effect of thermal stress on innate immune parameters of indigenous (Tharparkar) and crossbred cattle was compared. The indigenous cattle were found to be more resilient than crossbred cattle.

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